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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/676,656	10/01/2003	Ronald S. Cok	87021THC	8977

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EXAMINER	
HON, SOW FUN	

ART UNIT	PAPER NUMBER
1772	

DATE MAILED: 12/30/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/676,656	COK, RONALD S.	
	Examiner	Art Unit	
	Sow-Fun Hon	1772	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-31* is/are pending in the application.

4a) Of the above claim(s) *25-31* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *10/03/04* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *10/01/03*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:

I. Claims 1-24, drawn to an article, classified in class 428, subclass 1.31.

II. Claims 25-31, drawn to a process, classified in class 427, subclass 466.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions II and I are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case, the colored polymeric resin binder may be made in-situ by depositing a mixture of colorant and resin binder monomer over the layer of carbon nanotubes and then polymerizing the layer in lieu of process step b) of depositing a colored polymeric resin binder over the layer of carbon nanotubes.

3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

4. During a telephone conversation with Andy Anderson on September 27, 2004, a provisional election was made with traverse to prosecute the invention of Group I, claims 1-24. Affirmation of this election must be made by applicant in replying to this Office action. Claims 25-31 withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Claim Objections

5. Claim 3 is objected to because of the following informalities: There is a lack of antecedent basis for the term "additional conductive layer" in the parent claim 1. It is unclear whether it is an alternate term for the "transparent conductive electrode" in claim 1. Appropriate correction is required.

6. Claims 5-6 are objected to because it is unclear how a layer can have an electrically conductive side and an electrically insulating side, wherein the electrically insulating side is formed by a layer of polymeric resin binder, unless the sides are actually layers themselves. The conductive filter layer is then more properly a multilayer. Clarification is requested.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 1-13, 19-20, 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohtsu et al. (US 6,436,591) in view of Chung et al. (US 6,426,590), as evidenced by Pavlovsky (US 6,777,869).

Regarding claims 1, 20, Ohtsu teaches a conductive color filter (column 7, lines 20-30) which can comprise carbon black (column 8, lines 1-5) dispersed into a polymeric resin binder (water-soluble polymer) (column 8, lines 5-15). Ohtsu teaches that in the case of using carbon

black as a colorant for the black matrix, it is not always necessary to add another conductive component (column 8, lines 1-5), implying that it is desirable to add one.

Ohtsu fails to teach a layer of carbon nanotubules covered by the polymeric resin binder.

Chung teaches a layer of carbon nanotubules which emit electrons (column 9, lines 45-56) covered by a polymeric resin binder (abstract). The carbon nanotubules emit electrons, and are therefore highly conductive. The carbon nanotubules do not interfere optically with the colorant since they are light-transmitting, or transparent to visible light, as evidenced by Pavlovsky.

Pavlovsky teaches that the carbon nanotubules are so small that they are effectively transparent to visible light (column 2, lines 25-35).

Ohtsu teaches that even in the case of carbon black as a pigment, the addition of light-transmitting conductive material is needed to assure sufficient conductivity, especially when the ratio of polymer to the carbon black pigment is higher (column 8, lines 5-15).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have used the carbon nanotubules of Chung as the light-transmitting conductive material of Ohtsu, in place of or along with the carbon black of Ohtsu, in order to obtain a color filter with the desired high conductivity, wherein the carbon nanotubules of Chung do not interfere optically with the colorant in the filter, being light-transmitting, as evidenced by Pavlovsky.

Regarding claim 2, Ohtsu teaches that the color filter can be black (column 8, lines 1-5), red, green and blue (column 6, lines 60-65).

Regarding claim 3, Ohtsu teaches a transparent (light-transmitting) conductive electrode (film) in electrical contact with the conductive color filter (as a component of the color filter) (column 2, lines 55-60).

Regarding claim 4, Ohtsu teaches that the transparent (light-transmitting) conductive layer (film) is a thin (film) metal (column 16, lines 64-66). Metal alloys are the result of routine experimentation by one of ordinary skill in the art at the time the invention was made, in order to obtain an electrode layer with the desired balance of transparency and conductivity.

Regarding claims 5-6, the conductive color filter layer claimed by Applicant is treated as an electrically conductive layer abutting an electrically insulating layer. The term "side" of Applicant is hence interpreted as "layer".

Ohtsu teaches that in the color filter, the conductive color filter layer is stacked on a light-transmitting base substrate (column 18, lines 15-25). The light-transmitting substrate is preferably made of plastic (column 16, lines 60-65) which is electrically insulating. Therefore the conductive color filter can be a layer (multilayer) having an electrically conductive side (layer) and an electrically insulating side (layer). The thickness of the light-transmitting substrate is the result of routine optimization for one of ordinary skill in the art at the time the invention was made, in order to obtain a substrate which is sufficiently thick enough to maintain structural integrity during the deposition process of the conductive color filter layer.

Regarding claim 7, Ohtsu teaches that the transparent conductive electrode can be indium tin oxide (column 16, lines 63-67).

Regarding claim 8, Ohtsu teaches that the transparent conductive electrode (metal plating thin film) can be deposited upon (formed after) the conductive color filter (colored electrodeposition film) (column 15, lines 34-40).

Regarding claim 9, Ohtsu teaches that the conductive color filter can be deposited upon the transparent conductive electrode (forming the metal-plating thin film before the colored electrodeposition film) (column 15, lines 40-50).

Regarding claim 10, Ohtsu fails to teach that the conductive color filter further comprises a reflective conductor in electrical contact with the conductive color filter.

Chung teaches that the layer of carbon nanotubules are formed on top of a conductive silver paste layer which charges the carbon nanotubules with a negative electric charge so that it emits electrons (column 9, lines 35-45). The silver paste layer is inherently reflective. A reflective surface serves to reflect any stray light back through the color filter.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have placed the reflective silver conductor layer of Chung beneath and in electrical contact with the conductive color filter of Ohtsu, in order to obtain the desired electron and light emissivity, as taught by Chung.

Regarding claim 11, Ohtsu teaches that the conductive color filter is employed in a color display panel (column 1, lines 7-12), but fails to teach that the color display panel is a flat-panel.

Chung teaches that flat panel color display devices are widely used (column 2, lines 49-55).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have used the conductive color filter of Ohtsu in view of Chung in a flat-panel color display, as taught by Chung.

Regarding claims 12-13, Ohtsu teaches that the conductive color filter is formed on a light-emitting substrate (column 5, lines 1-5). Therefore the red, green or blue color filter (column 6, lines 60-65) is located over a light-emitting element of the display (claim 13). When the color is black to form a black matrix (column 8, lines 1-5), the color black inherently absorbs light, and is therefore located in a non-emissive area of the display (claim 12).

Regarding claim 19, Ohtsu teaches that the color display panel is an LCD display (column 2, lines 10-15).

Claim 20 has been discussed above.

Regarding claim 22, Ohtsu teaches that the conductive color filter is a layer wherein the electrolyte is uniformly dispersed, and the conductivity is extremely uniform (column 8, lines 20-30). Therefore the conductive color filter is a layer which has a tangible thickness and is conductive through the thickness of the layer.

9. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ohtsu in view of Chung, as evidenced by Pavlovsky, as applied to claims 1-13, 19-20, 22 above, and further in view of Jones (US 5,672,938).

Ohtsu in view of Chung, as evidenced by Pavlovsky, has been discussed above, and fails to teach an organic light emission device (OLED).

Jones teaches the use of electron injection into light emissive/organic materials to enhance the concentration of charge carriers in the organic material, and thereby enhance the

brightness and hence illumination efficiency of the organic material (column 1, lines 50-60), and that this can be used in organic light emission devices (electroluminescent lamps), field emission (emitter) devices and liquid crystal displays (technologies) (abstract), especially OLEDs (organic light emissive material-based devices) (column 1, lines 40-50).

Chung teaches that emission display devices have higher contrast ratio, larger viewing angle, higher maximum brightness, lower power consumption and a wider operating temperature range when compared to a conventional liquid crystal display (column 3, lines 1-10).

Therefore it would have been obvious to one of ordinary skill in the art to have used the conductive color filter of Ohtsu in view of Chung, in an OLED (organic light emission device) taught by Jones, in order to obtain a display with higher contrast ratio, larger viewing angle, higher maximum brightness, lower power consumption and wider operating temperature range, as taught by Chung, wherein the electron-emitting carbon nanotubules of Chung enhance the brightness and illumination efficiency of the conductive color filter of Ohtsu in view of Chung.

10. Claims 15-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohtsu in view of Chung and Jones, as evidenced by Pavlovsky as applied to claim 14 above, and further in view of Boroson et al. (US 6,226,890).

Regarding claims 15, 17, Ohtsu in view of Chung and Jones, as evidenced by Pavlovsky, has been discussed above, and fails to teach that the conductive filter is an anode or a cathode.

Boroson teaches that OLEDs (organic light emission devices) have an organic light-emitting layer which comprises an organic hole-transporting layer in contact with the anode and an organic electron-transporting layer in contact with the cathode (column 5, lines 34-44).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have used the conductive filter of Ohtsu in view of Chung, as an anode or a cathode, depending on the voltage bias, in order to obtain a display device which is an OLED, as taught by Boroson.

Regarding claims 16, 18, Ohtsu in view of Chung and Jones, as evidenced by Pavlovsky, has been discussed above, and fails to teach that the organic light emission device (OLED) is bottom emitting or top emitting.

Boroson teaches two embodiments, a bottom-emitting one 9 in Fig. 2 (described in column 5, lines 60-65) (claim 16) and a top-emitting one in Fig. 3A (inverted position described in column 5, lines 65-67) (claim 18).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have used the conductive filter of Ohtsu in view of Chung and Jones, in either a bottom-emitting or top-emitting OLED (organic light emission device), as taught by Boroson, for the desired end-use.

11. Claims 23-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohtsu in view of Chung and Jones, as evidenced by Pavlovsky, as applied to claim 14 above, and further in view of Yamada et al. (US 5,583,675).

Ohtsu in view of Chung and Jones, as evidenced by Pavlovsky, has been discussed above, and fails to teach an ultraviolet filter material dispersed in the polymeric resin binder.

Yamada teaches that color filters are directly exposed to ultraviolet rays, and that the color may be undesirably changed by the ultraviolet rays which can be avoided by adding an

ultraviolet absorber, acting an ultraviolet filter material, to the color filters (column 14, lines 40-50) (claim 24).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have dispersed the ultraviolet filter material in the polymeric resin binder of Ohtsu in view of Chung and Jones, in order to obtain a color filter with the desired protection as taught by Yamada, and which also functions as a protective layer for the OLED (organic light emitting device).

12. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ohtsu in view of Chung, as evidenced Pavlovsky, as applied to claims 1-13, 19-20, 22 above, and further in view of Boroson et al. (US 6,226,890).

Ohtsu in view of Chung, as evidenced by Pavlovsky, has been discussed above, and fails to teach a dessicant in the polymeric resin binder.

Boroson teaches that a dessicant is required to prevent premature degradation of device performance (column 1, lines 13-23), such as organic light-emitting devices (OLED) (column 1, lines 23-33). Boroson teaches that a device with an organic color filter overlay is subject to restrictions (column 2, lines 15-20) regarding the use of certain solvents to apply the dessicant to the organic-based devices (column 2, lines 1-10). Thus Boroson teaches that a dessicant is applied to an organic color filter overlay.

Therefore it would have been obvious to one ordinary skill in the art at the time the invention was made, to have dispersed a dessicant in the organic polymeric resin binder of the conductive color filter of Ohtsu in view of Chung, in order to prevent premature degradation of conductive filter performance, as taught by Boroson.

Any inquiry concerning this communication should be directed to Sow-Fun Hon whose telephone number (571)272-1492. The examiner can normally be reached Monday to Friday from 10:00 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Harold Pyon, can be reached on (571)272-1498. The fax phone number for the organization where this application or proceeding is assigned is (703)872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

S. Hon

Sow-Fun Hon

12/10/04